

STATEMENT OF

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BEFORE THE

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## **Importance of Science, Technology, Engineering and Mathematics (STEM)**

Honeywell is a Fortune 100 company that invents and manufactures technologies to address tough challenges linked to global macrotrends such as safety, security, and energy. Our business units include Aerospace, Automation and Control Solutions, Performance Materials and Technologies and Transportation Systems.

With approximately 132,000 employees worldwide, including more than 22,000 engineers and scientists, we have an unrelenting focus on quality, delivery, value, and technology in everything we make and do. Despite our diverse interests, we are united by a common commitment to research, development and engineering, which are essential for Honeywell's future growth. We oversee 97 research and engineering facilities, and have more than 32,000 patents or patents pending worldwide.

Without question, STEM education is vitally important to Honeywell's future, as well as the country's. If there were ever a time for the United States to make a concerted effort to discovering new possibilities and raising new questions through STEM education, it's today. We must inspire our future generation of scientists and engineers and ensure the men and women who educate them are properly prepared.

At Honeywell, we apply the same rigor and business tools we use in the workplace into helping the people and community around us. Through Honeywell Hometown Solutions (HHS) we build programs that deliver results we can quantify: one community, one home, one teacher and one student at a time.

We combine community outreach and focused leadership with financial support and volunteerism to address core community needs in areas where we have unique expertise.

We live in an increasingly connected world where data is transferred instantaneously to almost any point on Earth. A world integrated through technology offers challenges and opportunities for the United States and its workforce. To overcome those obstacles and maintain its position as the world's leading innovator, the time is now for the U.S. to re-emphasize the importance of learning through science, technology, engineering and math in our society.

American ingenuity has always been part of our nation's history. It is truly remarkable to reflect on all of the innovation that has come so quickly from our relatively young nation. While most of us are well aware of inventions like the lightning rod, the cotton gin, Morse code, the light bulb, the airplane and the Internet, we often overlook other innovations such as the skyscraper, modern refrigeration, the phonograph, the solar cell, the transistor and integrated circuit, the communications satellite, the mobile phone, GPS, and of course, two Honeywell favorites, the thermostat and the autopilot. For more than two centuries, American innovations have changed the face of the world, creating new industries and occupations, helping turn technological dreams into reality.

As we look towards the future, it is easy to envision a country increasingly reliant on citizens who have a basic understanding of STEM skills. Bureau of Labor Statistics

projections show that the top 20 fastest growing occupations through 2020 are largely comprised of professions that require significant science and math preparation.

Even the skills for occupations that historically did not require a high school education have dramatically shifted. According to a 2010 study by Georgetown University, 35 percent of blue collar jobs will require post-secondary education by 2018. A 2011 Georgetown study projects that the number of STEM jobs in the U.S. will grow by 1.2 million between 2008 and 2018.

Whether the workforce is focused on product innovation or simply making an existing product better; market innovation to discover and fulfill needs the customer didn't know they had; or business model innovation to revolutionize the industry, the road to success is paved by innovation.

At its core, innovation leads to new products and processes that sustain our industrial base. Innovation is fueled by a solid knowledge of math, science and engineering. We must reinforce our nation's commitment to long-term success and stability through innovation in the form of STEM education.

### **Our Current Educational System**

Although many Americans have confidence in our educational system, the fact is that compared to our international competitors, our students are falling behind. This is particularly true in the areas of math and science. Independent of other countries, U.S. students are, on average, getting worse in these subjects. Further, fewer and fewer are pursuing these subjects in college.

According to the 2011 National Report Card from the National Center for Education Statistics (NCES), about one-fifth of fourth-graders and one-quarter of eighth-graders were rated below a basic level in mathematics, and three-fourths of eighth-graders failed to reach a proficient level. In the latest Programme for International Student Assessment (PISA) test, which is administered in 65 industrialized nations, American students ranked 23<sup>rd</sup> in science and 31<sup>st</sup> in math.

According to Organisation for Economic Co-operation and Development (OECD) figures from 2009, despite lagging behind several countries in science and math scores, the U.S. spends more money per student than all of the countries with higher test scores.

The story is not much better at the higher educational levels. The interest of young Americans in science and technology has eroded over time. As indicated in a 2008 Congressional Research Service report, the share of math and physical science degrees awarded in the U.S. has declined steadily since 1970. In 2001, the U.S. produced 148,000 graduates in the science and technology fields, a 20 year low. According to Georgetown University, at the current rate, our educational system will fail to meet our economy's workforce demands by the end of 2018.

## **Our role in improving STEM education**

There is a growing consensus in the business, scientific and education community that we must revitalize our commitment to strengthen the pillars of American innovation and competitiveness – basic research in the physical sciences and math and science education. Further, America’s economic future increasingly depends on our ability to attract more of the best and brightest students into technological careers.

Investment in basic research in the physical sciences (chemistry, physics and materials) must be coupled with developing and retaining a high-quality mathematics and science teaching workforce. Coordinated efforts must be made to recruit pre-service teachers to enter mathematics and science studies and gain certification.

Honeywell is committed to these efforts because we recognize that now is the time to utilize our resources to share our passion for innovation and technology. We continue to support the community and make an impact in educating and connecting people to STEM issues as part of a committed journey in supporting education. Without question, Honeywell’s future workforce is reliant on our nation’s ability to train and educate future scientists and engineers.

To this end, many of Honeywell’s community programs are focused on STEM education, including Honeywell Educators at Space Academy, Honeywell Leadership Challenge Academy, Honeywell’s FMA Live! Program and Honeywell’s Initiative for Science and Engineering. In all, Honeywell’s Science and Math education programs have helped inspire more than 300,000 next-generation scientists one student at a time.

Honeywell’s goal is to excite and inspire students to engage in STEM education. Our initiatives are designed to nurture skills and talents in cross-functional ways in order to develop innovative, high value, high technology products and solutions. We pursue this effort with a relentless passion and focus so that we can help bring ever-greater levels of safety, capability and efficiency to the world. These programs are a part of Honeywell’s innovative approach to corporate social responsibility, Honeywell Hometown Solutions.

## **Honeywell Hometown Solutions (HHS)**

Building on a century-long tradition of corporate citizenship, Honeywell created an evolutionary approach to corporate social responsibility with Honeywell Hometown Solutions (HHS - <http://www51.honeywell.com/hhs>) in 2005. HHS’ programs focus on math and science education, family safety and security, housing and shelter, habitat and conservation, and humanitarian relief.

Since its beginning, Honeywell Hometown Solutions has become one of the most recognized corporate citizenship initiatives in the world, receiving more than 65 awards for its community outreach efforts. Led by President Tom Buckmaster, HHS’ innovative programming has demonstrated its vision of creating life-changing opportunities for teachers, students and communities worldwide. Together with leading public and non-

profit institutions, we are making a difference. Some of HHS's science and math education programs are described below.

### **Honeywell Educators at Space Academy**

When it comes to developing a new generation of scientists, we believe inspiration starts in the classroom. In partnership with the U.S. Space and Rocket Center, in Huntsville, Alabama, Honeywell created the Honeywell Educators @ Space Academy scholarship program for middle school math and science teachers.

During the annual five-day event in June, teachers participate in 45 hours of classroom, laboratory and training activities, focused specifically on science and space exploration. Participants work together on educational simulations that are realistic, exciting, and challenging. Activities include simulated astronaut training exercises, high-performance jet simulations, and scenario-based space missions.

The program introduces educators to new teaching practices in STEM education and gives them the ability to link their activities to professional development credits. More importantly, Honeywell Educators @ Space Academy allows participants to bring these practices and their experiences back to the classroom, where they can inspire their students.

We are pleased that more than 1,700 hundred teachers from 45 countries and 50 states and territories have graduated since 2004.

*"HESA [Honeywell Educators @ Space Academy] gave me new ideas to help transform my approach to teaching. I'm certain that one day I will watch one of my students walk on Mars. Now I have the tools to teach them how to get there." - John Moscato, Baltimore*

Find out more at <http://educators.honeywell.com>

### **Honeywell Leadership Challenge Academy**

Honeywell has created a week-long event available to children of its employees that provides participants the opportunity to develop their leadership skills through science-oriented workshops, lectures, and team exercises.

Honeywell's program was developed in partnership with the U.S. Space and Rocket Center and is designed to encourage high school students to pursue careers in science, technology, engineering and math.

The academy's unique curriculum has been created to challenge students in key areas: purposeful leadership; effective communication; integrated planning, team trust and cohesion; problem solving; and, critical thinking.

Since 2010, more than 630 students from 32 countries and states have participated in the weeklong event. In addition to sparking the interest of tomorrow's engineers and scientists, it helps to foster a sense of community among the larger Honeywell family.

*"HLCA [Honeywell Leadership Challenge Academy] was such a great experience for me. It reinforced my leadership skills and was the reason why I decided to major in engineering at Clemson University." - Christy Czarnecki, New Jersey*

Find out more at <http://leadership.honeywell.com>

## **FMA Live!**

FMA Live! was created by Honeywell and NASA in 2004. It is an award-winning hip hop science education program designed to engage middle school students and inspire them to pursue studies in STEM. The program targets middle school students because studies have shown this is the best time to engage students exploring potential career paths.

FMA Live! teaches Sir Isaac Newton's three laws of motion and the process of scientific inquiry in an innovative, entertaining and memorable way - featuring high-energy actors, music, video and demonstrations. The program delivers solid science theories that support the learning objectives of the National Science Education Standards for grades five through eight, but also helps students learn that science is the key to understanding the world around them.

Since its inception, FMA Live! has been performed for more than 317,000 students in more than 878 schools across the United States, Canada and Mexico. This year, Honeywell is revamping the program to include FMA Live!-Forces in Motion. The program will be more mobile, allowing us to reach more schools and students. We expect the pilot show to be ready in Spring 2013 and the formal launch to take place in Fall 2013.

Here's what students and educators are saying about FMA Live!:

*"My school community and I were blown away with the FMA Live! show. The real-world connection to force and motion, the extraordinary demonstrations that had us laughing, questioning and screaming simultaneously, and the professionalism of your actors, crew and production company sets this science show apart from any other. FMA Live! has a score of infinity on the charts of awesomeness for students and teachers alike!" - Gretchen Brinza, Teacher, Calmecca Academy, Chicago, IL*

*This show is the best. I got to ride in the race cars and they were so fun. The day after we had a science test over Newton's three laws. I got a B+ on that! I understand so much more after this show. I was very pleased to meet Larz, Chase and Candi. Thank you so much FMA Live!" - Makaela Snider, Student, Harrison High School, West Lafayette, IN*

Find out more at <http://fmalive.honeywell.com>

## **Honeywell Initiative for Science and Engineering**

Launched in 2011, the Honeywell Initiative for Science and Engineering program builds on the Honeywell-Nobel initiative, a global educational program established in 2006 that reaches universities in India, China, Latin America, Eastern Europe and other emerging regions through on-campus lectures from Nobel laureates.

Students get one-on-one access to the leaders in their field, allowing them to see firsthand that what they are studying today impacts the world around us.

The interactive Honeywell technology exhibit invites students to meet with Honeywell experts and discuss research efforts currently happening in their fields. Honeywell has sponsored more than 33 Nobel laureate events since 2006.

The Honeywell Initiative for Science and Engineering (HISE) program, along with partner universities all around the world, are working closely to cultivate and find the next generation of scientists in order to bridge the gap between learned technical skills with business acumen required in today's workplace.

Find out more at <https://www.honeywellscience.com>

## **Honeywell's Contribution to the Smithsonian – “Time and Navigation” Exhibit**

Honeywell is supporting the “Time and Navigation” exhibit at the Smithsonian's National Air and Space Museum. Honeywell has invested in this exhibit, which will highlight the untold story of “Getting from Here to There” for families who visit from across the world. They will be able to explore how revolutions in timekeeping have influenced how we find our way. This surprising connection between time and place has been crucial to navigation for centuries.

In this exhibit, visitors will be able to explore how improvements in navigation and time have changed our world. These innovations have given us a world where we never have to be lost again if we have the right device. They allow us explore more creatively. It is an important exhibit on an international scale. But the exhibit is even more important to the discussion we are having today because the United States has been the leader in navigation throughout this past century.

## **Conclusion**

Now is the time for us to strengthen and improve our nation's future. By taking a proactive approach to STEM education we increase the opportunity for innovations in a variety of disciplines benefiting not only the United States, but the people of the world. We must seize the opportunity to develop the next wave of innovators, scientists and engineers in order to make a positive impact in the years to come.

Honeywell recognizes that we have a role to play in that process, and our initiatives are reaching students and educators across the country. These programs attempt to address important federal goals of increasing the number of students who choose to pursue advanced degrees and careers in STEM fields. They also aim to increase STEM literacy for all students, including those who ultimately decide not to pursue STEM-related careers.

Honeywell is committed to ensuring the future is a bright one through the men and women involved in science, technology, engineering and math fields. Just as importantly, we are committed to educating and supporting the boys and girls of today who will ultimately become the innovators of tomorrow.

Through the efforts of company's like Honeywell, including those testifying with me here today, America will continue to serve as a stellar example of innovation for others to follow.